

HEYBURN STATE PARK  
REUSE APPLICATION  
TECHNICAL REPORT

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Prepared for  
Idaho Department of Parks and Recreation,  
Boise, Idaho 83716  
August 5, 2008

BROWN AND  
CALDWELL

*Environmental Engineers & Consultants*

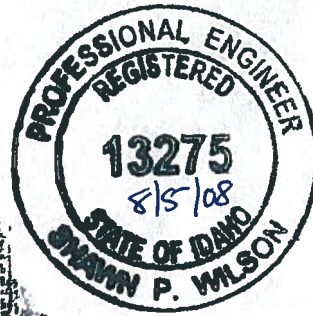
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## 1.5 Permits/Licenses/Approvals

The following permits, etc., are or will be applied for:

Table 1.1 Permits, Licenses and Approvals

| Permit or Approval                                 | Jurisdiction | Status    | Filing Date |
|----------------------------------------------------|--------------|-----------|-------------|
| Wastewater Reuse Permit Application                | DEQ          | Filed     | August 2008 |
| Conveyance Bid Documents                           | DEQ          | Not Filed | August 2008 |
| WWTF Bid Documents                                 | DEQ          | Not Filed | August 2008 |
| Idaho Transportation Department (ITD) Encroachment | ITD          | Filed     | July 2008   |

## 2. PROCESS DESCRIPTION

This section provides a general overview of the proposed WWTF and land application facilities. The section discusses the proposed sewers and service area, the preliminary layout and design of the proposed facility, and service area. Treatment includes screening, aerated lagoon treatment and disinfection with sodium hypochlorite to meet Class C treatment standards. After treatment, the Class C reclaimed water will be land applied via a pressurized irrigation system on a separate tract of land within the Park which is located remotely from the areas used by the public.

Figure 1-2 shows the proposed land use and sewer service area within the Park. Construction of the sewer collection system will begin first, construction of the treatment will follow, and hook up of the individual cabins to the collection system will conclude construction.

### 2.1 Wastewater Flow Projections

The Recommended Standards for Wastewater Facilities – Great Lakes – Upper Mississippi River Boards of State Sanitary Engineers (Ten States Standards) recommends a wastewater generation rate of 100 gallons per capita day (gpcd) for typical dwellings. This value is inclusive of base sanitary flow and normal infiltration and inflow (I/I) and used for each cabin site in the Park. To determine the planning level wastewater generation rate for other facilities in the Park, historical usage rates obtained from Park staff were used. As a conservative estimate, a value of 100 gpcd was applied to cabin dwellings based on an average population of 2.5 persons per residence consistent with IDEQ 58.01.03 “Individual/Subsurface Disposal Systems” rule Section 007.07a for a three-bedroom house. Therefore, the equivalent flow projection per cabin dwelling was estimated at 250 gallons per day (gpd).

The non-residential wastewater generation rates have been estimated using Park historical records. Based on these assumptions, average and peak wastewater flow projections for each type of facility are presented in Table 2.1.

Residential peak hourly wastewater flows (as shown in Table 2.1) have been calculated using a peaking factor provided in the Ten States Standards, and typical values applied in similar projects. This value depends upon the population contributing to the projected flow ( $P$  = population in thousands), and is calculated using the following equation:

$$\text{Peaking Factor} = Q_{\text{Peak Hourly}} / Q_{\text{Average}} = (18 + P1/2) / (4 + P1/2)$$

While peak hourly flows will be used for sewer, screen and disinfection design, average daily flows are more important when designing wastewater treatment facilities. Given that the average daily flow estimates listed in



Table 2.1 include a built-in allocation for I/I, the aerated lagoon wastewater treatment process will be designed for average daily flow of 68,000 gpd as shown in Table 2.1 below.

Table 2.1 Wastewater Flow Projections

| Facility                           | Number of Facilities                      | Unit Flow Rate                | Total Flow (gpd) | IDAPA 16.01.03.08                                       |
|------------------------------------|-------------------------------------------|-------------------------------|------------------|---------------------------------------------------------|
| <b>Chatcolet:</b>                  |                                           |                               |                  |                                                         |
| Cabins                             | 55                                        | 250 gal/day                   | 13,750           | Single Family Dwelling                                  |
| Float Homes                        | 24                                        | 250 gal/day                   | 6,000            | Single Family Dwelling                                  |
| Campgrounds                        | 1 units with hook-ups<br>42 units without | 125 gal/space                 | 125              | Travel Trailer Park with Sewer and Water Hook-up        |
| CCC Restroom                       | Supports 42 unit campground               | 90 gal/space                  | 3,780            | Designated Camp Area Toilet and Shower Wastes           |
| CCC Day Use Park Restroom          | 50 visits per day                         | 5 gal/visit                   | 250              | Public Restroom Toilet                                  |
| Marina Restroom                    | 200 cars/day                              | 2 persons/car 5 gal/person    | 2,000            | Public Restroom Toilet                                  |
| Dock Pump-out Station              | 10 private boats<br>Resort Cruise boat    | 100 gal/week<br>100 gal/month | 146              | Historical Records                                      |
| Concessions Stand                  | 4,500 visitors/month 150 meals/day        | 13 gal/ meal                  | 1,950            | Conventional Food Service; Toilet and Kitchen Wastes    |
| <b>Rocky Point:</b>                |                                           |                               |                  |                                                         |
| Cabins                             | 80                                        | 250 gal/day                   | 20,000           | Single Family Dwelling                                  |
| Lodge with 3 Toilets and 2 Showers | 6 rooms, 2 persons per room               | 35 gal/person                 | 420              | Overnight Accommodations with Central Toilet and Shower |
| CCC Restroom                       | 4 restrooms, 400 visits per day           | 5 gal/person                  | 2,000            | Public Restroom Toilet                                  |
| <b>Hawley Landing:</b>             |                                           |                               |                  |                                                         |
| Cabins                             | 12                                        | 250                           | 3,000            | Single Family Dwelling                                  |
| CG and Volunteer Sites             | 8 units with hook-ups<br>44 units without | 125 gal/space                 | 1,000            | Travel Trailer Park with Sewer and Water Hook-up        |
| Restroom Building                  | Supports 44 unit campground               | 90 gal/space                  | 3,960            | Designated Camp Area Toilet and Shower Wastes           |
| Tent Camp Restroom                 | 2 toilets, 10 spaces                      | 65 gal/space                  | 650              | Camp Area Toilet Wastes only                            |
| Future Campsites                   | 20 sites                                  | 35 gal/day                    | 700              |                                                         |
| RV Dump Station                    | 30 dumps per day                          | 40 gallons per use            | 1,200            | Historical Records                                      |
| Welcome Center                     | 2,500 visitors/mo.<br>5 offices           | 5 gal/person<br>25 gal/person | 417<br>125       | Public Restroom Toilet                                  |
| <b>Other:</b>                      |                                           |                               |                  |                                                         |
| Hansen's Haven                     | 1                                         | 250                           | 250              | Single Family Dwelling                                  |
| Plummer Point Restrooms            | Day use only, 200 visits/day              | 5 gal/person                  | 1,000            | Public Restroom Toilet                                  |
| Future Campsites                   | 50                                        | 90 gal/day                    | 4,500            |                                                         |
| Maintenance Building               | 2 employees                               | 25 gal/employee               | 50               | Office - No Showers                                     |

Table 2.1 Wastewater Flow Projections

| Facility                     | Number of Facilities | Unit Flow Rate | Total Flow (gpd) | IDAPA 16.01.03.08                                |
|------------------------------|----------------------|----------------|------------------|--------------------------------------------------|
| Employee Cabin               | 1                    | 320            | 320              | Single Family Dwelling                           |
| Volunteer RV sites near shop | 4                    | 125            | 500              | Travel Trailer Park with Sewer and Water Hook-up |
| <b>Total</b>                 |                      |                | <b>68,093</b>    | <b>Design Average Flow, GPD</b>                  |

Equivalent flow per ERU = 2.60 at completion of Development. (Equal to Total Average Flow Divided by Total Residences.)

Flows will fluctuate based on the time of year. This is a recreational area so the greatest flows will be in the summer months and the lowest flows will be in the winter months. To estimate the flow pattern during the year, the water usage at the Park during the year was evaluated. Below is the annual wastewater flow patterns estimated for the WWTF (Figure 2-1).

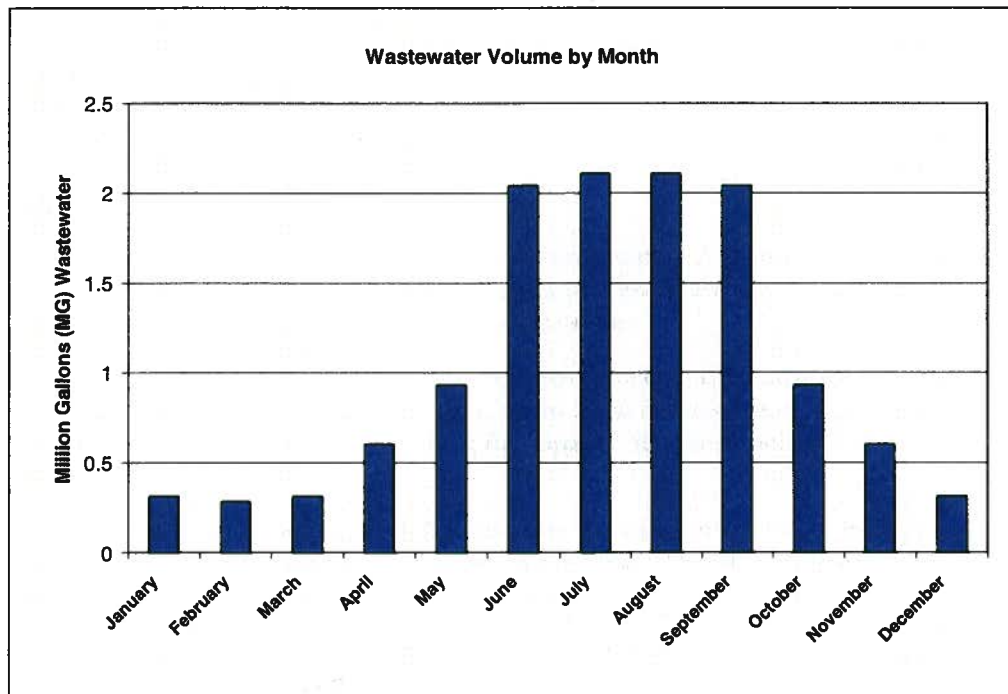


Figure 2-1. Wastewater Volumes by Month

## 2.2 Wastewater Treatment Components

### 2.2.1 Wastewater Treatment Overview

Sewage from each source will be collected through a collection system and pumped to the WWTF. The raw sewage will enter the WWTF at the Headworks Building. The sewage will be screened and flow via gravity to an aerated lagoon biological treatment system. Following treatment in the lagoons, the wastewater will flow to settling ponds where solids will accumulate and supernatant will be collected, disinfected with chlorine to produce Class C reuse quality water and pumped to storage ponds. During the irrigation months, treated effluent will be taken from the storage ponds and applied to land via a pressurized irrigation system.